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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
EDMONDSON, LYNNE RENEE	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-7

Office Action Summary	Application No.	Applicant(s)	
	09/913,014	FAN ET AL.	
	Examin r	Art Unit	
	Lynne Edmondson	1725	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-9, 13, 14 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Walker et al. (USPN 5734108).

Walker teaches an apparatus and method for detecting the oscillation amplitude of an oscillating object by placing an object between radiation detecting means and an optical radiation source (104) located opposite each other wherein first and second sensing areas (from each 104 sensor) are used and a processor is coupled to the detectors to receive output signals representing the radiation sensed as an indication of object oscillation amplitude (figure 1, col 9 line 36 – col 10 line 10 and col 11 lines 1-28). The processor monitors and controls output (col 34 line 51 – col 35 line 41) based on the signals received as compared to a reference value (col 14 line 59 – col 15 line 34, col 19 line 57 – col 20 line 40). Amplitude is controlled in real time (col 16 lines 50-65). The sensing areas are adjacent and directed toward opposing sources as shown in

figure 1. The sensing areas are not directed toward the source and comprise directing optics in another embodiment (figures 16-18). It is noted that the width of the sensing area and sum of the amplitude do not further limit the apparatus. See also Walker claims 1-7, 16-25 and 26-33.

3. Claims 1-9, 13, 14 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Kotidis et al. (USPN 5623307).

Kotidis teaches an apparatus and method for detecting the oscillation amplitude of an oscillating object by placing an object between radiation detecting means (26) and an optical radiation source (24) located opposite each other wherein first and second sensing areas are used and a processor is coupled to the detectors to receive output signals representing the radiation sensed as an indication of object oscillation amplitude (figure 2c, col 4 line 62 –col 5 line 32 and col 11 lines 24-67). Other sensor/source configurations are shown in figures 2a and 2b. The processor monitors and controls output based on the signals received as compared to a reference value (col 1 lines 20-35, col 4 lines 20-42 and col 10 lines 45-58) for ultrasonic wave control. Amplitude is controlled in real time (col 4 lines 52-61). Multiple areas are detected (scanned, col 20 line 50 – col 21 line 5). The sensing areas are adjacent (sensing from one side to the other) and directed toward the source as shown figures 2a-2c (col 23 line 58 – col 24 line 11). In an alternate configuration (figures 3-7) the sensing areas are not directed toward the source but rather use optical devices to direct the radiation to the sensing

areas. The width of the sensing areas is presumably greater than the half width and amplitude of the oscillating object however this area does not further limit the apparatus.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-7 and 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama et al. (USPN 6323943) in view of Walker et al. (USPN 5734108).

Maruyama teaches an apparatus and method for detecting the oscillation amplitude of an oscillating object with radiation detecting means and an optical radiation source located opposite each other wherein first and second sensing areas (2) are used and a processor is coupled to the detectors to receive output signals representing the radiation sensed as an indication of object oscillation amplitude (figures 6, 46, 51, col 10 line 53 – col 11 line 53 and col 26 line 31 – col 27 line 65). See also col 24 lines 1-52 and col 21 lines 1-53. The processor monitors and controls output based on the signals received as compared to a reference value (col 4 lines 3-39 and col 27 line 48 – col 28 line 42) for ultrasonic wave control. Amplitude is controlled in real time (col 23 lines 59-67). The sensing areas are adjacent and directed toward opposing sources as shown in figures 46 and 51. The width of the sensing areas is greater than the half width and amplitude of the oscillating object (col 3 lines 6-30 and col 8 lines 20-53). The

oscillating object is an ultrasonic transducer of a welder or wire bonder (col 5 lines 10-36 and col 27 lines 1-2). See also Maruyama claims 1-43. However, there is no disclosure of the sensor/source configuration such that the object lies between them.

Walker teaches an apparatus and method for detecting the oscillation amplitude of an oscillating object by placing an object between radiation detecting means and an optical radiation source (104) located opposite each other wherein first and second sensing areas (from each 104 sensor) are used and a processor is coupled to the detectors to receive output signals representing the radiation sensed as an indication of object oscillation amplitude (figure 1, col 9 line 36 – col 10 line 10 and col 11 lines 1-28). The processor monitors and controls output (col 34 line 51 – col 35 line 41) based on the signals received as compared to a reference value (col 14 line 59 – col 15 line 34, col 19 line 57 – col 20 line 40). Amplitude is controlled in real time (col 16 lines 50-65). The sensing areas are adjacent and directed toward opposing sources as shown in figure 1. The sensing areas are not directed toward the source and comprise directing optics in another embodiment (figures 16-18).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ sensors and detectors proximate the area to be measured. Sensors and detectors may be placed in any configuration which can move with the wire bonder and thereby inspect at real time, with high accuracy in a simplified manner (Maruyama, col 2 lines 38-67).

6. Claims 1-7 and 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotidis et al. (USPN 5623307) in view of Kajiwara et al. (USPN 5431324).

Kotidis teaches an apparatus and method for detecting the oscillation amplitude of an oscillating object by placing an object between radiation detecting means (26) and an optical radiation source (24) located opposite each other wherein first and second sensing areas are used and a processor is coupled to the detectors to receive output signals representing the radiation sensed as an indication of object oscillation amplitude (figure 2c, col 4 line 62 –col 5 line 32 and col 11 lines 24-67). Other sensor/source configurations are shown in figures 2a and 2b. The processor monitors and controls output based on the signals received as compared to a reference value (col 1 lines 20-35, col 4 lines 20-42 and col 10 lines 45-58) for ultrasonic wave control. Amplitude is controlled in real time (col 4 lines 52-61). Multiple areas are detected (scanned, col 20 line 50 – col 21 line 5). The sensing areas are adjacent (sensing from one side to the other) and directed toward the source as shown figures 2a-2c (col 23 line 58 – col 24 line 11). In an alternate configuration (figures 3-7) the sensing areas are not directed toward the source but rather use optical devices to direct the radiation to the sensing areas. The width of the sensing areas is presumably greater than the half width and amplitude of the oscillating object however this area does not further limit the apparatus. However, the processing apparatus is not further disclosed.

Kajiwara teaches an ultrasonic bonder or welder with an ultrasonic wave controller (abstract) comprising means for detecting vibration of an ultrasonic welding tool or wire bonding tip (col 1 lines 28-56 and col 2 lines 35-66) using an optical source

and detector (col 6 line 24 – col 7 line 25 and col 7 line 42 – col 8 line 40). See also Kajiwara claims 1-12.

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the vibration detecting apparatus in an ultrasonic welder or wire bonder as the heated process or processing apparatus for which wave motion must be controlled (Kotidis, col 1 lines 20-35). In this manner, a variety of processes including but not limited to bonding can be controlled in a nondestructive manner in real time (Kotidis, col 3 lines 45-61 and col 4 lines 43-61).

Response to Arguments

7. Applicant's arguments with respect to claims 6, 10-12 and 15 have been considered but are moot in view of the new ground(s) of rejection.

8. Regarding applicant's argument that Walker teaches a rotation detector rather than a vibration detector, the rotation of the shaft is due to vibratory oscillations as disclosed in column 1 lines 18-38, col 4 lines 50-67 and column 2 lines 38-61, particularly lines 51-61 which teach the need for monitoring the vibration amplitude. Sensors and sources are disposed in heads on opposite sides of the shaft as shown in figure1 (described in col 1 line 33 – col 2 line 30) with alternate configurations shown in figures 27a – 27g.

Therefore the 102 rejection of claims 1-5, 7-9, 13, 14 and 16-18 as anticipated by Walker stands and now includes claim 6. It is noted that the width of the sensing area and sum of the amplitude do not further limit the apparatus.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Vikhagen (WO 01/73373 A1, vibrating object between source and sensors), Monroe (USPN 6392692 B1, vibrating object between source and sensors), Kinrot et al. (USPN 6424407 B1, method and apparatus), O'Meara et al. (USPN 6285514 B1, method, apparatus, equation), von Raben (USPN 4854494), Siu (USPN 6181431 B1) and Kajiwara et al. (USPN 54313254).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on M-F from 7-4 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7118 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson
Examiner
Art Unit 1725

1/9/03

LRE
January 8, 2003